

Mobile Phone Reminders Can Improve Medication Adherence in HIV Positive Patients Treated with Anti Tubercular Drugs, Experience from a Tertiary Care Teaching Hospital of Odisha

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ABSTRACT

Background: Present study, aimed at exploring the role of mobile phone reminders in improving drug adherence in patients of tuberculosis with HIV AIDS. **Methods:** 36 patients were in the study group while 24 no of patients served as the control. Reminders were provided in Oriya language by SMS. Adherence to the treatment schedule was evaluated by asking them a fixed set of questions at the end of 4th, 8th and 12th week. All the patients were categorized as either highly adherent, moderate adherent or low adherent depending on answers. **Results:** Mobile phone reminders significantly improved the adherence at the end of 12 weeks only compared to control group. **Conclusion:** Educational status of the patient and approach to mobile phone was found out to important contributor for improving adherence by reminder.

Keywords: HIV, Antitubercular Drugs.

INTRODUCTION

The World Health Organization declared tuberculosis (TB) a global public health emergency in 1993 and since then has intensified its efforts to control the disease worldwide.^[1] The rapidly increasing rates of coexisting HIV infection has increased the burden.^[2] HIV patients with secondary tuberculosis are burdened with pill overload which can be one of the reasons for increased drug resistance seen in these patients. Mobile phones are now extensively used by people of all socio economic background. One study from South India has proved that mobile phone reminders can improve adherence to Anti-retroviral therapy.^[3] Information education communication (IEC) can significantly improve adherence to anti-malarial treatment in patients of uncomplicated Pl. Falciparum infections.^[4]

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Review of Literature:

There is a two-way interdependent relationship between economic poverty and chronic disease. Many of the world's poor, experience the same discouraging cycle despite regional differences in geography, culture and commerce. Being healthy requires money for food, sanitation and medical care, but to earn money, one must be healthy. The lack of adequate care for chronic conditions forces poor families to face a heavy burden of caring for their loved ones that undermines the development of their most basic roles. Improving adherence requires a continuous and dynamic process and recent research in the behavioral sciences has revealed that the patient population can be segmented according to level-of-readiness to follow health recommendations. The lack of a match between patient readiness and the practitioner's attempts at intervention means that treatments are frequently prescribed to patients who are not ready to follow them. Health care providers should be able to assess the patient's readiness to adhere, provide advice on how to do it, and follow up the patient's progress at every contact where patient-tailored interventions are required. There is no single intervention strategy, or package of strategies that has been shown to be effective across all patients, conditions and settings.

Consequently, interventions that target adherence must be tailored to the particular illness-related demands experienced by the patient to accomplish this, health systems and providers need to develop means of accurately assessing not only adherence, but also those factors that influence it. DALY. Poor adherence further complicates the challenges of improving health in poor populations, and results in waste and underutilization of already limited treatment resources. Adherence to ART is challenging, because patients need almost perfect adherence of at least 95 percent to keep viral load at undetectable levels as long as possible and to maintain the functionality of the immune system. A recent meta-analysis of adherence levels found that a pooled estimate of only 77 percent of people taking antiretroviral medications in sub-Saharan Africa adhered to the regimen.^[3] Overall; there are little data on the adherence levels reached at health facilities providing routine ART services. Patients in developed and developing countries face common barriers to adherence like fear of disclosure, forgetfulness, difficult regimens, high pill burden, suspicions about treatment, concomitant substance abuse, work and family responsibilities, falling asleep, and access to medication. In resource-poor countries, access to medication is further challenged through patient's socioeconomic conditions and the availability of medication.⁴ There is documentation of number of interventions being carried out successfully in high-income settings. They include interventions which could be classified in the following categories—

- Directly observed therapy also known as DOT (including Modified-DOT and Directly Administered Antiretroviral Therapy [DAART])
- Social support
- Knowledge and counseling
- Financial incentives
- Technological

Defining adherence:

The extent to which a person's behavior – taking medication, following a diet, and / or executing lifestyle changes, corresponds with agreed recommendations from a health care provider.(WHO 2003- 4). Strong emphasis is given on the need to differentiate adherence from compliance. The main difference is that adherence requires the patient's agreement to the recommendations. In other word patients should be active partners with health professionals in their own care and that good communication between patient and health professional is a must for an effective clinical practice. However because of number of constraints as described earlier innovative and effective interventions are required for successful completion /maintenance of Anti-retroviral or Anti tubercular drugs Interventions to Improve ART Adherence at the Facility Level.

Literature review explores that the survey questionnaires for both Govt. implicated programs and the health care facilities, can contain to improve adherence to ART

- Patient counseling before starting ARVs
 - Repeated counseling after ARVs
 - Use of a support/care person
 - Systematic monitoring at the clinic
 - Social support
 - Use of a technological device
 - Use of community-based health workers
 - Fast-track services at the health care facility
 - Use of reminder devices
 - Reimbursement of travel expenses
 - Additional financial incentives
- Recommendations for Interventions to Improve Adherence to ART Practices in Resource-Constrained Settings.

Many participants proposed providing social support, making health services better accessible to the patients, and improving health care providers' capacity and motivation. While most of the health care providers working with patients on ART were able to make suggestions on how to improve adherence in their setting, they found it more difficult to explain the underlying problems that the interventions recommended would ultimately address.

Food support and reimbursement of transport costs were frequently suggested by the respondents of many survey participants to improve adherence to ART. Food support was recommended to target poor patients, to be provided to children, or given under specific criteria only. Clothing and shelter was also indicated as required by some patients. Some facilities recommended linking patients at the hospital to the community or community-based organizations so that they can receive the needed support there. Respondent suggested providing health insurance to the needy patients so that they can access health services.

Psychological Support

Psychological support including peer support was said to help patients disclosing their HIV status to family or friends and for patients to motivate each other. One suggestion was to provide peer support and encourage patients to exchange experiences during clinic visits. An alternative suggestion was to form patient organizations. Other respondents suggested the use of social workers as a means of alleviating patients' worries. Psychological support was only sometimes directly emphasized. Interventions suggested to improve communication may have also sometimes included psychological support to the patient, but was not categorized as such.

Health Care Facility Location

A number of recommendations were made on providing health care services in closer proximity to

the patient's residence. Suggestions included decentralization of health care services or the provision of home-based care. Home-based care was recommended in combination with treatment observation. Additional recommendations included making home-based treatment services more attractive to volunteers or community health workers by providing incentives, such as making transportation available to conduct home visits. As an alternative approach, some survey participants suggested an extension of clinic hours and opening at weekends to provide services to more patients.

Health Provider Capacity and Motivation

Health care providers suggested an increase in the number of health care staff and provision of additional training and refresher training. Regular medical supervision was recommended as a way to improve the quality of health care services and to motivate staff.

Use Reminders for Patient Adherence

Adherence aids were suggested by a number of participants with particular emphasis on pill boxes and medication calendars. Timers were recommended by a facility treating pediatric patients. Telephone reminders were also recommended.

Improved Adherence Monitoring

Some respondents suggested providing a DOT system at the patients' homes. An evaluation of adherence rates at the clinic and establishing relevant measures to improve adherence was recommended. Facilities could reinforce skills of staff to monitor adherence, conduct pill count, and to improve defaulter tracing. Close monitoring was recommended for after office hours. One respondent suggested using medication event monitoring system caps to improve adherence.

Improved Patient Counseling and Communication for adherence

A number of different approaches were suggested to improve counseling. These included involving domestic partners in counseling and providing spiritual counseling, or providing intensified counseling for specific patients. The use of peer counselors was often recommended. Counseling and written information were recommended to be given in the patient's native language. Some respondents emphasized the need to increase patient literacy to increase adherence to ART Practices in resource-constrained settings.

Understanding and willingness to adhere to the medicines.

One respondent suggested that for patient literacy education to be effective, it must be systematic, routine, and integrated as part of the patient's overall

treatment. By having all patients go through literacy education, they would feel that they have "ownership" of their treatment. In addition to these main categories of responses, facility providers made few additional suggestions:

- An analysis of the major reason for non-adherence before introducing interventions to improve adherence
- Set up a separate room for adherence counseling
- Conduct viral load and resistance testing at the tertiary level
- Improve access and availability of all medicines to ensure reliable and uninterrupted supply of medicines
- Computerize to reduce paper work
- Introduce free laboratory and treatment services
- Ensure that each unit of the Armed Forces has a comprehensive clinic with fully equipped laboratory and pharmacy

Aims & Objectives:

The survey aimed at answering the following questions:

1. Whether mobile phone communication between health care workers and patients in community can improve adherence to both Anti Tubercular and Anti Retroviral therapy in patients suffering from both disorders simultaneously
2. What is the feasibility and acceptability status of mobile phone communications for measuring and improving health outcomes in a resource poor state like Odisha.

MATERIALS AND METHODS

For his study, about 50 nos of diagnosed HIV-AIDS patients on antiretroviral drugs and clinically diagnosed to have tuberculosis on anti-tubercular drugs attending ART centre or pulmonary Medicine Dept. of SCB Medical College, Cuttack were selected and enrolled for the study. 30 patients were enrolled to intervention group and 20 patients served as control group on a random basis. The protocol was approved by Institutional ethics committee. (Attached). A semi structured questionnaire was administered to those enrolled patients, who were accessing treatment. Socio- demographic, lifestyle, HIV medication, and drug history were obtained from them. Adherence was self-reported.

Inclusion criteria:

1. Diagnosed cases of tuberculosis with AIDS on both anti-tubercular and anti-retroviral drugs
2. Having mobile phone personally or any of the first relation residing with patient.

Exclusion criteria:

1. Patients having any other form of secondary infections
2. No mobile phone / no knowledge of using mobile phones

Intervention: All participants in the study group of 30 no of patients will receive two types of adherence reminders regarding both Anti tubercular and Anti-retroviral medications on their supplied mobile phone number.

- a. Interactive voice call
- b. Non interactive neutral short message service once in a week for the entire study period of three months duration.

Measurement of drug adherence: For this study, a standardized WHO method (indirect method of measurement of drug adherence) was adopted in the form of self-reporting by the patients.^[5]

In the self-report, the health care worker guides clients through a series of questions to which they respond yes or no. An adherent client will respond no to all questions. This helps validates responses since ordinarily clients tend to respond yes to any questions posed to them by a health care professional to please them. Participant's adherence was assessed at end of every month. (ie at the end of 4th, 8th and 12th week) for both Anti tubercular and Anti-retroviral medications with the help of two different set of questionnaire either by direct interview or telephonic conversation, Given below.

Outcome measure:

1. Percentage of adherence to treatment (Intervention group) compared to control group patients at three different time intervals.
2. Participants experience at the end of study period to both interactive call and SMS.

Statistical Analysis:

Chi square test will be applied for test of significance.

Measuring adherence by Self Reporting of patients on telephonic call:

In this method, patients tend to answer yes to questions posed to them by their health care provider to please them. Based upon this observation, the questions have been designed so that an adherent client gives a no response.

- A. Do you sometimes find it difficult to remember to take your medication? Yes / No
This question aims to test whether there are established dosing cues in the client's daily routine.
- B. When you feel better, do you sometimes take a break from your medication? Yes / No
Clients frequently stop taking their medication when their presenting health problem has been resolved.
- C. Thinking back over the past four days, have you missed any of your doses? Yes / No
Try to get the client to think back over the past few days. It may help to identify a routine daily event such as meals, work, or television programs watched, and enquire about the nature of that event four days previously.

For example, ask the client what they had for dinner on Tuesday.

- D. Sometimes if you feel worse when you take the medicine, do you stop taking it? Yes No
If the presenting health problem has not produced symptoms or the problems have been resolved, and there are bothersome side effects from the medicine, clients find it difficult to rationalize continued adherence.

Assessing Adherence

Count the number of No answers to questions A through D.

- If all 4 answers are No, then the client is classified as being highly adherent.
- If there is 1 Yes answer, then the client is classified as being moderately adherent.
- Where there are 2 or more Yes answers, the client is classified as having low adherence.

RESULTS

Adherence study:

A total of 50 patients included in our study who were on both Anti tubercular and anti-retroviral drugs during the study period of 4 months duration.(May- August.)

Table 1: Comparison of adherence to ATT & ART at the end of 4 weeks

Adherence	Mob Intervention Gr. (30 nos)	Control Group (20 nos)
Highly adherent	20 (66.6%)	10 (50%)
Moderate Adherence	8 (26.6%)	6 (30%)
Low Adherence	2 (6.6%)	4 (20%)

Table 2: Comparison of Adherence to ART & ATT at the end of 8 weeks

Adherence	Mob Intervention Gr. (30 nos)	Control Group (20 nos)
Highly adherent	20(66.6%)	10(50%)
Moderate Adherence	10(33%)	7(35%)
Low Adherence	0(nil)	3(15%)

Table 3: Comparison of Adherence to ART & ATT at the end of 12th weeks

Adherence	Mob Intervention Gr. (30 nos)	Control Group (20 nos)
Highly adherent	26 (87%)*	9(45%)
Moderate Adherence	4 (13.3 %)	7(35%)
Low Adherence	0 (nil)	4(20%)

* Significant Pearson Chi-square value 4.678 at 12th week of observation. Asymp. Sig. (2-sided), value , 0.031 Computed only for a 2x2 table

In the control group, all patients those who are highly adherent remain highly adherent at the all-time of observation, so also for moderate and low adherent group. This suggests that, adherence to drugs varies as per individual personality and his socio- cultural surroundings. The result generated from above study suggests that, people are well

aware about the frequency of drug administration during the initial part of the diagnosis. Thus there is no significant change in percentage adherence to both the two regimens at the end of 4th week and 8th week of intervention compared to control group. However there is a significant improvement in highly adherent groups between 8th to 12th weeks of mobile phone intervention. Similarly in moderately adherent groups significantly better adherence was noticed between 4th to 8th weeks. But as time progresses adherence level gradually decreases, and mobile phone reminders can significantly improve the adherence on long term basis. In general, most of the patients, either in control or test group were adhering to treatment at least in first few weeks of starting of therapy. Thus low adherence was almost negligible. Mobile phone reminders were well accepted by patients and their relatives. Many a times the phones of the study participants were in out of reach mode. Usually there was one mobile phone for one family. Only the first hand relations like wife, mother, father, son and daughter were responding better. The reminders essentially should be in vernacular language. The reminders should be very crisp and simple to be followed by our people who are usually poor and illiterate.

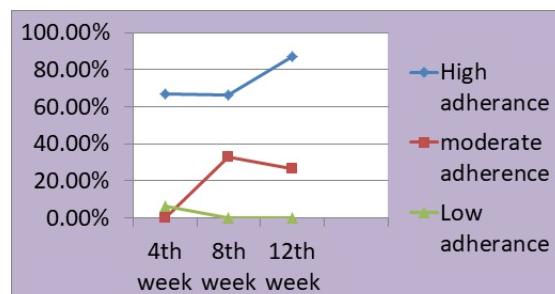


Figure 1: Mobile SMS Intervention Group on both ART & ATT

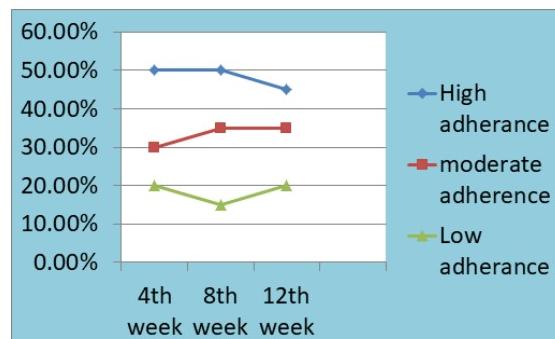


Figure 2: Control groups of patients on both ART & ATT

DISCUSSION

Our study proves that mobile phone reminders from very beginning of medicines use can improve drug adherence in complicated situations like co existing TB with HIV – AIDS.

However in order to appreciate the beneficial effect long term intervention is required. After initial two

months of therapy, even the highly adherent participants became less adherent gradually.

And mobile phone reminders in this situation can significantly help prevent this dangerous trend. There can be many reasons for the cause, that why highly adherent people in first month gradually shifted either to moderate or low adherent in control group. The participants opined that, improvement in signs and symptoms is one of the important cause for not to use medicines.

CONCLUSION

Mobile phone communications or reminders is well accepted patients with chronic diseases like AIDS with tuberculosis. This strategy is well accepted by our patients. However it is very essential that only first relatives should be communicated if the patient himself is not carrying the mobile to appreciate the beneficial effect. This study conclusively proves that mobile phone reminders can improve adherence to medications in chronic disorders like AIDS and Tuberculosis in resource constraint state of ours. Mobile phone reminders can be a very good tool for improving drug adherence in patients of tuberculosis with HIV AIDS who are overburdened with pills and disease. Limited duration of study period was a limiting factor for our study.

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